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(54) Solid-fuel simulating gas fire

(57) A solid-fuel simulating gas fire has a distribution chamber 7, an injector 2 for injecting a mixture of gas and air into the distribution chamber, a perforated sheet or mesh 10 e.g. stainless steel at the top of the chamber 7 and, on top of the mesh a perforated sheet 12 of material having good thermal insulation properties e.g. ceramics through which the gas and air mixture flows. A number of elements 21 of ceramic material, representing coal or coke, are provided on top of the sheet 12.

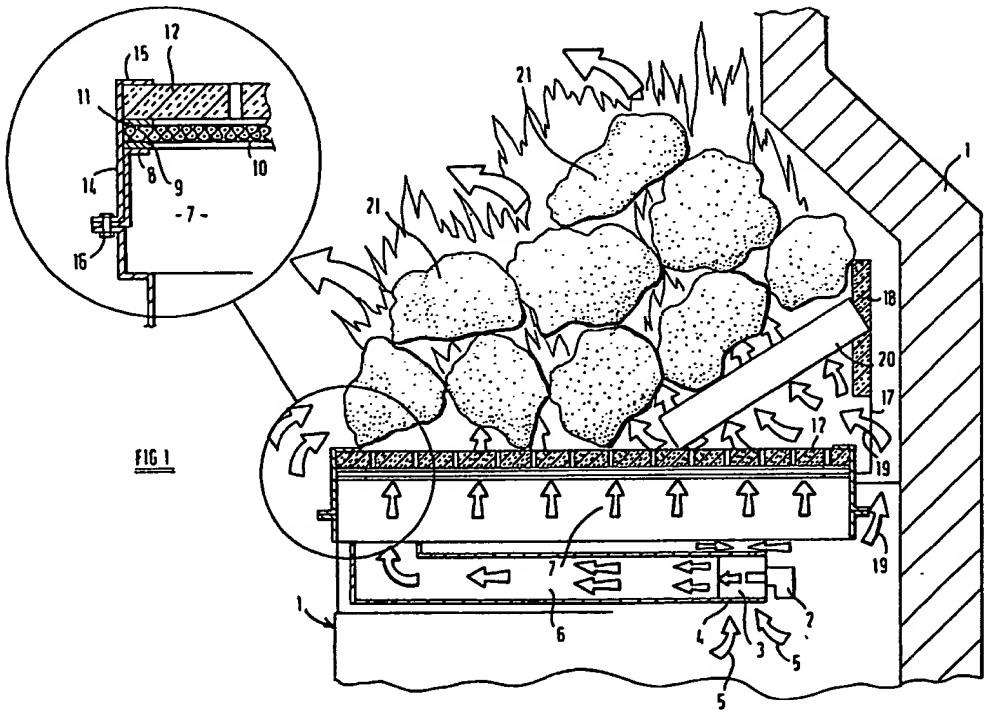

FIG 1

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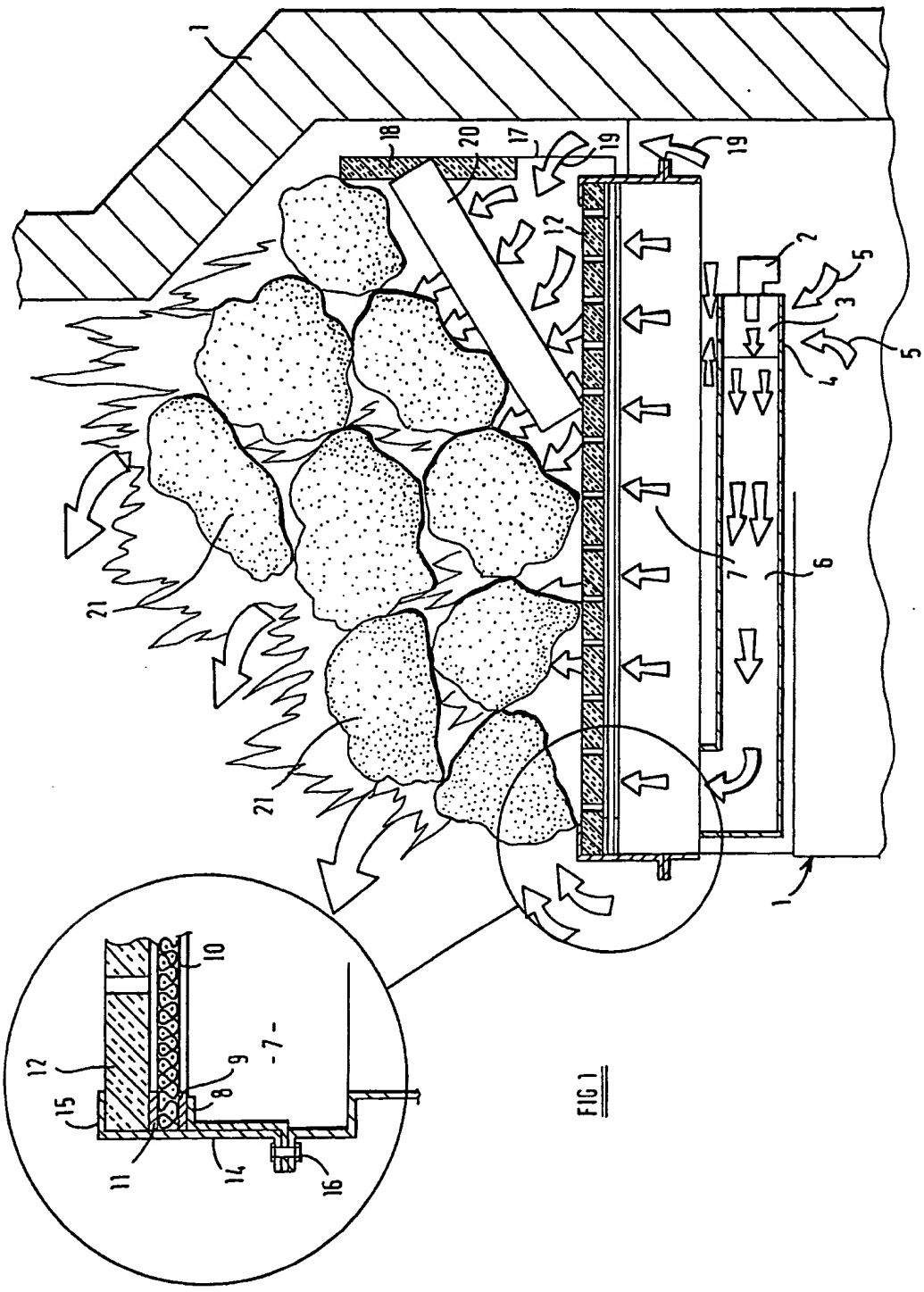

FIG 1

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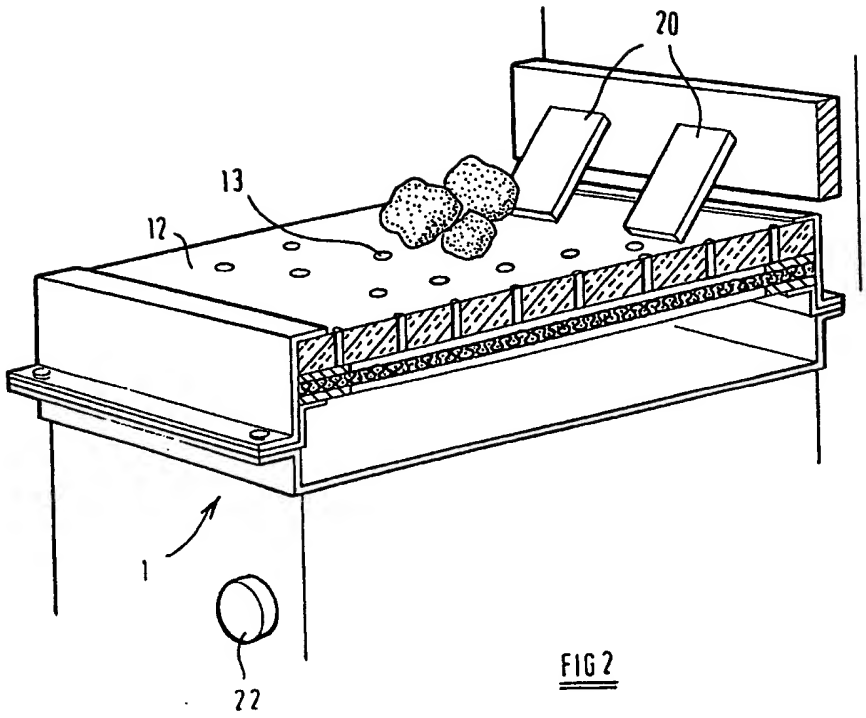

FIG 2

SPECIFICATION

Improvements in or relating to a gas fire

THE PRESENT INVENTION relates to a gas fire and more particularly the present invention relates to a gas fire which visually simulates a solid fuel fire.

It has been proposed previously to provide gas fires which simulate solid fuel fires, such as a simulated coal or coke fire. Such prior proposed devices usually comprise a perforated metal sheet on top of which a plurality of ceramic elements are located which simulate the coal or coke. Underneath the perforated metal sheet is a plenum chamber into which a gas/air mixture is injected. The gas/air mixture passes up through the apertures in the metal sheet, and is ignited in the region of the ceramic elements which simulate the coal or coke. Heat, from the resultant flame, is reflected, by means of the ceramic elements that simulate the coal or coke towards the metal sheet, and the temperature of the metal sheet rises significantly. Thus the temperature within the plenum chamber can also rise and this is undesirable. Also the temperature of the gas injection and the associated central mechanism will rise, which is also undesirable.

According to this invention there is provided a gas fire, said gas fire comprising a distribution chamber and means for injecting, into said distribution chamber, a mixture of gas and air, and means for permitting the egress of the gas/air mixture from the top of said mixing chamber comprising a perforated sheet or mesh through which the gas/air mixture may flow and a perforated sheet of material having good thermal insulating properties through which the gas air mixture may subsequently flow, a plurality of elements of ceramic material being provided on top of said sheet of material having good thermal insulation properties.

Preferably said sheet of material having good thermal insulation properties is a sheet of a ceramic material.

The perforations in the sheet of ceramic material may be approximately 2.5mm in diameter and approximately 25mm apart.

Advantageously said perforated sheet or mesh is a mesh of metal, such as a stainless steel mesh. The mesh may be a 25 gauge 25 mesh.

Preferably the sheet of ceramic material consists substantially of 52% Al_2O_3 and 47% SiO_2.

Advantageously a back board is provided which is located substantially vertically adjacent the rear of the said board of material having good thermal insulating properties, there being a plurality of ceramic elements located in position extending between the said board having good thermal insulating properties and the backboard, the arrangement being such that an air passage is defined to permit air to flow between the backboard and the said sheet of material having good thermal insulating properties, and through the said ceramic elements into the said plurality of radiant elements.

In order that the present invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a cross sectional view through part of a fire in accordance with the invention, and

Figure 2 is a part cut-away perspective view of the fire shown in Fig. 1.

Referring initially to the drawings a gas fire in accordance with the present invention is intended to be located in a fire place having a chimney, the fire place having a fire back 1 formed of fire brick or the like.

The gas fire, in accordance with the invention, consists of a housing 1. Mounted within the housing is a multi-hole gas injector 2 which injects gas into a venturi chamber 3 having air inlet ports 4 through which air may be drawn, as indicated by the arrows 5, from an air chamber container within the housing 1. The gas/air from the venturi passes to a venturi mixer tube 6 which has an upwardly extending terminal portion communicating with the base of a distribution or plenum chamber 7 which is located in an upper region of the housing 1. Adjacent the top of the plenum chamber 7 is an inwardly directed flange 8 on which rests a sealing gasket 9 formed of an appropriate material, such as a 3mm strip of ceramic paper. Resting on the gasket 9 is stainless steel perforated mesh 10 which extends across the entire top of the plenum or distribution chamber 7. Resting on top of the edge portion of the mesh is a second gasket 11 which has the same size and configuration as the gasket 9, and is made of the same material. Resting on top of the second gasket 11 is a ten millimetre thick sheet of ceramic material 12, this material being provided with perforations 13. The perforations 13 are in a regular square array with the perforations being 25mm apart. Each aperture is 2.5mm in diameter. Other sizes and spacings may be found to be appropriate, and thus the apertures may be placed to provide flames where desired.

The preferred ceramic material consists of 52% AL_2O_3 and 47% S_iO_2 and preferably comprises a rigid board composed of mechanically interlaced fibres and an alumino silicate mineral binder. The typical board may be a board sold under the designation "Kerlane 45" by S.E.P.R. of 67 Boulevard De Chateau, 9220 Neuilly-Ser-Seine.

This material is able, in use, to withstand a

temperature of 1,100°C.

The described components are retained in position by means of clamps 14, the clamps each having, at their upper end, an inwardly directed flange 15 adapted to engage the top surface of the ceramic sheet 12, the clamps being retained in position by appropriate bolts 16 or the like. The gaskets on each side of the mesh are thus compressed to form a seal. The compression is sufficient to form a seal, but is not so great that cracking occurs through the inability of the seal to accommodate expansion and contraction of the mesh.

A plurality of support brackets 17 support in position a vertical back plate 18 which may be made of ceramic. The black plate 18 is spaced from the upper surface of the horizontal ceramic sheet 12 and thus an air space is defined to permit air to flow, as indicated by the arrows 19, from an air chamber defined within the housing 1 beneath the plenum or mixing chamber 7, into a region on top of the ceramic sheet 12 adjacent the base of the back plate 18.

A plurality of rectangular brick-like elements, preferably formed of ceramic material, are mounted in position on the assembly as thus described, the brick like elements resting, in an inclined way, on the ceramic plate 12 and on the back plate 18. The brick-like elements 20 are spaced apart.

A plurality of ceramic radiant elements 21, representing coal or coke, are then positioned in a pile on top of the ceramic sheet 12, with some of the elements resting on top of the brick-like elements 20.

A control knob 22 may be provided to control the supply of gas to the fire.

When the supply of gas is switched on, gas will be injected, by the multi-hole injector 2 into the venturi chamber 3, and in a conventional way air wil be entrained to flow with the jet of gas. The gas and air will mix in the venturi mixing passage 6 and will then flow into the plenum or distribution chamber 7. The gas/air mixture will flow upwardly through the stainless steel mesh, and then through the array of apertures in the ceramic board 12. The gas/air mixture will then flow between the ceramic elements, where there will be a certain amount of surface combustion or radiant combustion. Some of the gas air mixture will emerge, at the top of the pile of ceramic radiant elements, where it will burn as a free flame.

It is to be appreciated that air flowing as indicated by the arrows 19 will pass between the inclined brick-like elements 20, and will thus also pass into the pile of ceramic elements 21.

In use of the gas fire the top surface of the ceramic sheet may become very hot and indeed may become red hot. However, the ceramic sheet has substantial thermal insulating properties and thus heat is not, to a significant extend, radiated downwardly through the ceramic element into the distribution or plenum chamber 7. The ceramic sheet causes re-radiation of heat off the ceramic elements 21, thus increasing the temperature at the centre of the pile of ceramic elements, and also increasing the radiant heat output. In order to minimise any risk of lighting back the stainless steel mesh is provided beneath the ceramic sheet. The stainless steel mesh has a sufficiently small aperture size to prevent lighting back. A suitable mesh is 28 gauge 28 mesh.

Whilst the invention has been described with reference to one particular embodiment it is to be appreciated that many modifications may be effected without departing from the scope of the invention.

CLAIMS

1. A gas fire, said gas fire comprising a distribution chamber and means for injecting, into said distribution chamber, a mixture of gas and air, and means for permitting the egress of the gas/air mixture from the top of said mixing chamber comprising a perforated sheet or mesh through which the gas/air mixture may flow and a perforated sheet of material having good thermal insulating properties through which the gas air mixture may subsequently flow, a plurality of elements of ceramic material being provided on top of said sheet of material having good thermal insulation properties.

2. A gas fire according to claim 1 wherein said sheet of material having good thermal insulation properties is a sheet of a ceramic material.

3. A gas fire according to claim 1 or 2 wherein the perforations in said sheet of material having good thermal insulation properties are each approximately 2.5mm in diameter.

4. A gas fire according to any one of the preceding claims wherein the perforations in said sheet of material having good thermal insulation properties are approximately 25 mm apart.

5. A gas fire according to any one of the preceding claims wherein said perforated sheet or mesh is a mesh of metal.

6. A gas fire according to claim 5 wherein said mesh of metal is a stainless steel mesh.

7. A gas fire according to claim 5 or 6 wherein said mesh is 25 gauge 25 mesh.

8. A gas fire according to any one of the preceding claims wherein the sheet of ceramic material consists substantially of 52% Al_2O_3 and 47% SiO_2.

9. A gas fire according to any one of the preceding claims wherein a back board is provided which is located substantially vertically adjacent the rear of the said board of material having good thermal insulating properties, there being a plurality of ceramic elements located in position extending between the said

board having good thermal insulating properties and the backboard, the arrangement being such that an air passage is defined to permit air to flow between the backboard and the said sheet of material having good thermal insulating properties, and through the said ceramic elements into the said plurality of radiant elements.

10. A gas fire substantially as herein described with reference to and as shown in the accompanying drawings.

11. Any novel features or combination of features disclosed herein.

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